

**Abstract Title Page**

**Title:** Learning profiles: The learning crisis is not (mostly) about enrollment

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## **Abstract Body**

### **Background / Context:**

This section will detail what has been written on learning profiles since the term was introduced in 2006, what other studies have used learning profiles.

### **Purpose / Objective / Research Question / Focus of Study:**

We measure learning in primary school using survey data on reading and math skills of a nationally representative, population-based sample of children in India, Pakistan, Kenya, Tanzania, and Uganda. We demonstrate that learning levels among primary and secondary students in the much of the developing world are extremely low and lag far behind the rich world, constituting what we refer to as a “learning crisis.”

Beyond demonstrating the learning crisis, we seek to estimate how much children learn -- measured by reading and mathematics tests -- as they progress through primary school. The main methodological challenge is that while the ASER and Uwezo surveys test children at all relevant ages and grade levels, they do not track the same children over time. So we are left to infer a longitudinal learning trajectory from cross-sectional data.

We conduct some simple regressions of scores on grade level to determine how learning changes as children progress through school. These results suggest similar or more rapid learning in East Africa than South Asia. However, we hypothesize that this finding may be biased by non-random dropout and grade repetition. This paper explores this hypothesis and discusses strategies for creating learning profiles with cross-sectional data.

### **Setting:**

India, Pakistan, Kenya, Tanzania, and Uganda

### **Population / Participants / Subjects:**

The data come from child assessments. Children age 5 to 15 were assessed in and out-of-school in the five countries. See discussion below about representativeness. The dataset we’ve assembled has over 5 million observations.

### **Intervention / Program / Practice:**

There is no intervention – we are analyzing assessment data.

### **Research Design:**

Regression analysis

## **Data Collection and Analysis:**

We have assembled a dataset of over five million student observations from publically available datasets: ASER India data from 2007 to 2014, ASER Pakistan data from 2012 to 2014, Uwezo Tanzania data from 2009 to 2012, Uwezo Uganda data from 2010 to 2012, and Uwezo Kenya data from 2009, 2011 and 2012. See Table 1 summary table about the dataset

## **Findings / Results:**

Simple regressions of scores on grade level suggest similar or more rapid learning in East Africa than South Asia. This finding may be biased by non-random dropout and grade repetition. Dropout during primary school appears rare in all countries, but patterns of grade progression differ markedly between South Asia (where most children progress through grade eight regardless of learning levels) and East Africa (where children progress much more slowly). Worst-case bounds for these learning trajectories suggest regression estimates may greatly overstate learning in East Africa, and reverse the ordering of learning progress between the East African and South Asian countries in our sample. (See Table 2.)

The obvious concern is that children with high test scores in upper grades were smart to begin with, while their peers who dropped out or repeated grades had lower baseline scores. In principle this bias could go either direction, but the more plausible concern seems to be that naive estimates will exaggerate real learning rates.

Two basic empirical facts about the five countries in our sample should inform this discussion. First, children dropping out' of primary school is not a frequent occurrence. Second, slow grade progression is a much more common phenomenon -- with wide variance across countries. (Table 1.) We measure the share of children who start grade one at the recommended age and remain on track to complete grade eight within eight years. This means starting at age six in all countries except Tanzania, where primary school begins at age seven, and finishing at age thirteen (fourteen in Tanzania) -- i.e., we measure the share of children having attained grade one by age six, grade two by age seven, ..., grade eight by age thirteen. Barely a majority of children even begin school on this trajectory. But in India and Pakistan, once they have started, children tend to remain on this age-grade trajectory. Meanwhile, in Kenya, Tanzania, and Uganda, the share of children in the "correct" grade drops precipitously over the age range. In Uganda, over 75 percent of children begin grade one at age six, but fewer than 3 percent attain grade eight by age fourteen.

## **Conclusions:**

The differential patterns of grade progression have direct implications for our calculation of learning profiles. In this section we provide guidance on the calculation of learning profiles.

## **Appendices**

### **Appendix A. References**

## Appendix B. Tables and Figures

**Table 1**

	<b>Pakistan</b>	<b>India</b>	<b>Kenya</b>	<b>Tanzania</b>	<b>Uganda</b>
Represent- ativeness	Urban and rural*	Rural only	National**	National	National
Child sample size for latest year	27,733 /251,694	569,229	153,900	104,568	81,650
Years	2012-14	2009-14	2009, -11, - 12	2010-12	2010-12
# years	3	6	3	3	3
# Obs in RISE paper dataset	692,869	3,571,855	377,445	251,327	225,671

\*Urban and rural sampled separately, \*\*except for 2/158 districts

**Table 2: Enrollment and Grade Progression**

	(1) India	(2) Pakistan	(3) Kenya	(4) Tanzania	(5) Uganda
Enrolled (%)					
Age 6	98.8	90.3	69.7		97.6
Age 7	98.6	92.3	86.6	78.7	98.6
Age 8	98.7	92.7	91.8	90.1	98.8
Age 9	99.0	93.3	95.2	93.0	99.2
Age 10	98.2	92.5	95.7	93.7	98.8
Age 11	98.5	93.2	97.0	94.4	99.3
Age 12	97.0	91.5	96.3	93.6	98.8
Age 13	96.4	90.6	96.5	93.0	98.5
Age 14				90.1	
Correct grade (%)					
Age 6	57.4	35.8	47.3		75.4
Age 7	48.6	33.4	32.4	60.7	26.2
Age 8	41.2	30.0	26.2	43.6	18.6
Age 9	41.1	26.6	21.5	35.7	12.5
Age 10	39.3	27.4	17.7	29.2	8.5
Age 11	38.4	20.3	16.8	27.3	5.9
Age 12	32.5	17.2	13.4	23.8	3.9
Age 13	36.9	20.0	12.0	24.0	2.5
Age 14				10.6	
Observations	2,079,895	400,779	244,469	209,402	154,667

Table 3: Learning Profiles

		(1)	(2)	(3)	(4)	(5)
		India	Pakistan	Kenya	Tanzania	Uganda
Math:						
	Grade	0.26*** (0.0006)	0.43*** (0.0009)	0.41*** (0.0014)	0.30*** (0.0018)	0.50*** (0.0023)
	Age	0.095*** (0.0005)	0.0044*** (0.0009)	0.019*** (0.0013)	0.055*** (0.0018)	0.083*** (0.0017)
	Obs.	2095179	450489	245654	206797	156057
	R-squared	0.37	0.51	0.45	0.3	0.48
Lower bound						
	Age + Grade	0.27*** (0.0005)	0.30*** (0.0010)	0.088*** (0.0008)	0.062*** (0.0009)	0.065*** (0.0025)
	Obs.	754240	90049	29750	22281	3938
	R-squared	0.32	0.49	0.29	0.17	0.15
Reading:						
	Grade	0.30*** (0.0006)	0.44*** (0.0010)	0.48*** (0.0015)	0.38*** (0.0021)	0.59*** (0.0022)
	Age	0.10*** (0.0006)	0.0081*** (0.0009)	0.0054*** (0.0014)	0.070*** (0.0020)	-0.013*** (0.0017)
	Obs.	2104633	450691	243606	205482	154631
	R-squared	0.39	0.51	0.49	0.35	0.49
Lower bound						
	Age + Grade	0.31*** (0.0005)	0.31*** (0.0010)	0.16*** (0.0012)	0.15*** (0.0019)	0.21*** (0.0043)
	Obs.	757368	89857	29297	22170	3914
	R-squared	0.36	0.5	0.35	0.22	0.38